

CLAIMS

46 ~~45~~ An electronic label reading system including:
at least one information bearing electronic coded label including a label
transmitter antenna and a label receiver antenna;
5 an interrogator including an interrogator transmitter antenna and an
interrogator receiver antenna;
a magnetic field coupling link containing a transmitter coil and a receiver
coil for communication between the interrogator and the label;
wherein the coupling link is arranged such that it operates in the near field
10 of said transmitter coil and wherein substantially none or at most a minority of the
magnetic flux which excites said receiver coil also links said transmitter coil.

46. ~~2.~~ An electronic label reading system as claimed in claim ⁴⁵ ~~4~~ wherein said
interrogator includes said transmitter coil and said label includes said receiver
15 coil.

47. ~~3.~~ An electronic label reading system as claimed in claim ⁴⁵ ~~4~~ wherein said
label includes said transmitter coil and said interrogator includes said receiver
coil.

20 48. ~~4.~~ An electronic label reading system as claimed in claim ⁴⁵ ~~4~~ wherein said
transmitter or receiver coil contains a magnetic core.

49. ~~5.~~ An electronic label reading system as in claim ⁴⁵ ~~4~~ wherein said label
25 includes a label antenna operated in proximity to a metal object and the metal
object provides substantial reduction of the amount of magnetic field that would
reach the receiver coil from the transmitter coil in relation to the magnetic field
which would reach said receiver coil if the metal object were not present.

30 50. ~~6.~~ An electronic label reading system as claimed in claim ⁴⁵ ~~4~~ wherein said
coupling link is used for signaling from the interrogator to the label.

51. ~~7.~~ An electronic label reading system as claimed in claim ⁴⁵ ~~4~~ wherein said
coupling link is used for signaling from the label to the interrogator.

⁵²
~~8~~ An electronic label reading system as claimed in claim ⁴⁵~~4~~ wherein the interrogator provides power to the label to generate a reply from the label.

5 ⁵³
~~9~~ An electronic label reading system as claimed in claim ⁴⁵~~4~~ wherein the label generates replies intermittently.

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~~10~~ An electronic label reading system as claimed in claim ⁵³~~8~~ wherein power for the label comes from power supplied by the transmitter during the period of
10 the label giving a reply.

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~~11~~ An electronic label reading system as claimed in claim ⁵⁰~~6~~ wherein the label may be read while a sheet of metal is interposed between the interrogator and the label.

15 ⁵⁶
~~12~~ An electronic label reading system as claimed in claim ⁵⁵~~11~~ wherein said sheet of metal is of substantial extent.

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~~13~~ An electronic label reading system as claimed in claim ⁵⁵~~11~~ including a label
20 antenna coil wherein the transmitter and receiver coils have parallel axes.

⁵⁸
~~14~~ An electronic label reading system as claimed in claim ⁴⁹~~5~~ including a label antenna coil wherein the label coil is excited by a magnetic field created by surface currents on metal of an object carrying said label.

25 ⁵⁹
~~15~~ An electronic label reading system as claimed in claim ⁴⁹~~5~~ wherein currents are induced on one side of the metal object by using a magnetic field creating antenna, wherein a pathway on said metal object allows those currents to pass to the other side of said metal object, and wherein said label containing a
30 magnetic field responding antenna is placed close to the currents on said other side of said metal object so that said magnetic field responding antenna interacts with the magnetic field which accompanies said currents on said other side of said metal object.

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⁶⁰
~~16.~~ An electronic label reading system as claimed in claim ⁵⁹~~15~~ wherein said pathway is provided by holes in said metal object.

⁶¹
~~17.~~ An electronic label reading system as claimed in claim ⁵⁹~~15~~ wherein said
5 currents induced on one side of said metal object travel toward an edge of said metal object.

⁶²
~~18.~~ An electronic label reading system as claimed in claim ⁵⁹~~15~~ wherein currents change direction when they reach said other side of said metal object.

⁶³
~~19.~~ An electronic label reading system as claimed in claim ⁶⁰~~16~~ wherein edges
10 of the holes in said metal are perpendicular to the direction of said induced current.

⁶⁴
~~20.~~ An electronic label reading system as claimed in claim ⁶⁰~~16~~ wherein said holes are extended in the direction of a magnetic field created by said magnetic field creating antenna.

⁶⁵
~~21.~~ An electronic label reading system as claimed in claim ⁶⁰~~16~~ wherein said
20 holes are a natural part of said object.

⁶⁶
~~22.~~ An electronic label reading system as claimed in claim ⁶⁰~~16~~ wherein said holes are added to said object.

⁶⁷
~~23.~~ An electronic label reading system as claimed in claim ⁵⁹~~15~~ wherein
25 conduction current on said metal object does not flow in closed paths.

⁶⁸
~~24.~~ An electronic label reading system as claimed in claim ⁶⁷~~23~~ wherein the path of currents which flow on said metal object is completed by a displacement
30 current.

⁶⁹
~~25.~~ An electronic label reading system as claimed in claim ⁴⁷~~24~~ wherein said label is placed in a slot in the metal object.

FOOTNOTES

- ⁷⁰
28. An electronic label reading system as claimed in claim ⁶⁹25 wherein the length of said slot, in the direction perpendicular to the path of currents in the region of the slot, is significantly greater than the length of the label coil or its ferrite core in that direction.
- 5 ⁷¹
27. An electronic label reading system as claimed in claim ⁶⁹25 wherein the whole of said label is inside the main outline of said metal object.
- ⁷²
28. An electronic label reading system as claimed in claim ⁴⁷28 including a label
10 antenna coil wherein the label coil is resonant in its operating frequency band.
- ⁷³
29. An electronic label reading system as claimed in claim ⁷²28 wherein the resonant frequency is adjusted for proximity of the label to the metal of the object carrying the label.
- 15 ⁷⁴
30. An electronic label reading system as claimed in claim ⁶⁹25 wherein the object being labelled is an airline cargo pallet, and said label is locked in position by employing slots already made in said pallet for the purpose of cargo lock down.
- 20 ⁷⁵
31. An electronic label reading system as claimed in claim ⁷⁴30 wherein barbs on said label lock it in place in a re-entrant slot in the pallet.
- ⁷⁶
32. An electronic label reading system as claimed in claim ⁷⁴30 wherein an
25 interrogator antenna is placed parallel to and between rollers of a conveyor system.
- ⁷⁷
33. An electronic label reading system as claimed in claim ⁷⁶32 wherein the rollers have a non-conducting surface or non-conducting bearings.
- 30 ⁷⁸
34. A method of obtaining information from an electronic label in proximity to a metal object, said label containing a label transmitter antenna and a label receiver antenna, said method including the steps of:

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providing a magnetic field coupling link containing a transmitter coil and a receiver coil for communication between the interrogator and the label; and

5 arranging said coupling link such that it operates in the near field of said transmitter coil and wherein substantially none or at most a minority of the magnetic flux which excites said receiver coil also links said transmitter coil.

⁷⁹
~~25~~ A method as claimed in claim ⁷⁸~~34~~ wherein said interrogator includes said
10 transmitter coil and said label includes said receiver coil.

~~30~~ A method as claimed in claim ~~34~~³⁸ wherein said label includes said transmitter coil and said interrogator includes said receiver coil.

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